

Missouri STEM Report 2020-2030



DEPARTMENT OF
HIGHER EDUCATION &
WORKFORCE DEVELOPMENT

Missouri STEM and STEM-Related Occupations

STEM (Science, Technology, Engineering, and Mathematics) and STEM-Related occupations are some of the most in-demand and highest paying jobs in Missouri. The need for such employees is projected to grow about one and a half times more than the average for all occupations. The projected growth rate for STEM and STEM-Related occupations from 2020-2030 is 11.05 percent, while the statewide average growth rate for all occupations is 7.3 percent. By 2030, the total employment for STEM and STEM-Related occupations is expected to be more than 433,000, an increase of over 43,000 jobs.

Wages for STEM and STEM-Related occupations are higher than the average wage for all occupations. The average 2020 wage for all occupations in Missouri is \$50,140, while the average wage for STEM and STEM-Related occupations is \$79,441.

Education is the key to meeting the demand for STEM and STEM-Related workers. Of the 178 STEM and STEM-Related occupations in Missouri, 173 require some level of postsecondary education. Most occupations typically require a bachelor's degree (69 occupations) or a master's degree and beyond (73 occupations). Additionally, 30 occupations require an associate degree, five occupations require a high school diploma or equivalent, and only one occupation requires some college, no degree.

SCIENCE

Science includes those who conduct research and experiments in labs and areas of natural science. Outdoor fieldwork is an integral part of biological science occupations. Natural science technicians play a key role in assisting scientists in their experimentation and discovery.

TECHNOLOGY

Technology occupations are commonly found in the areas of computer information technology but also include any occupation that requires technical skill. Technology workers create new software, develop databases, and assist users in maintaining their computer's performance.

ENGINEERING

Engineers develop and test new products. Engineers incorporate elements of science, technology, and math in their work. There are Civil, Electrical, and Mechanical Engineers, among others, as well as drafters and technicians who assist in the process.

MATH

Math is part of many occupations, but for some occupations, mathematics is a required skill. Actuaries, Statisticians, and Research Analysts use mathematics for risk assessment, problem solving, and various types of data analysis.

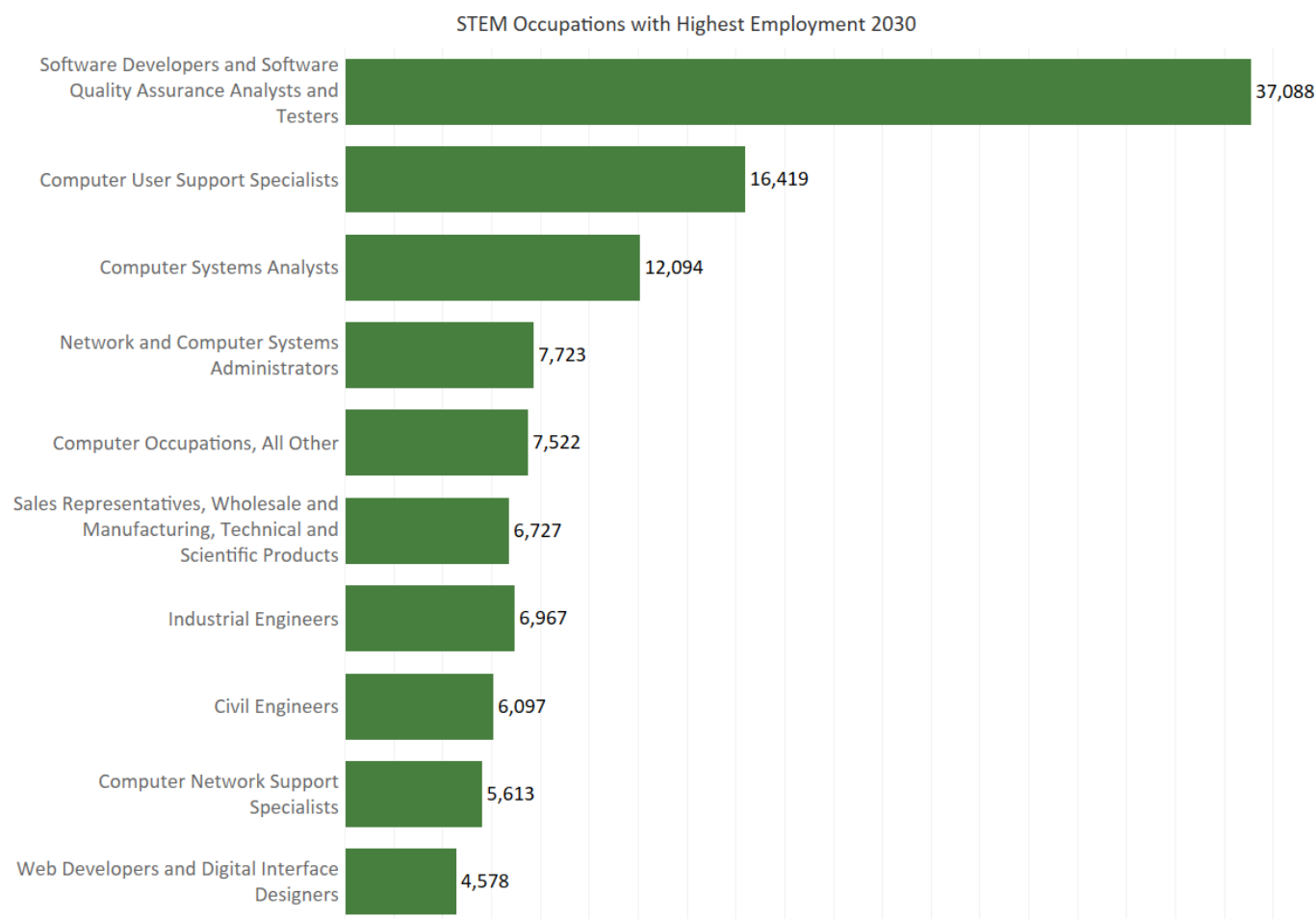
STEM-Related Occupations

STEM-Related occupations include *Architecture* and *Health Care* occupations. They mainly focus on design and patient care but also rely heavily on many of the STEM principles. In Missouri, there are 114 STEM occupations and 64 STEM-Related occupations.

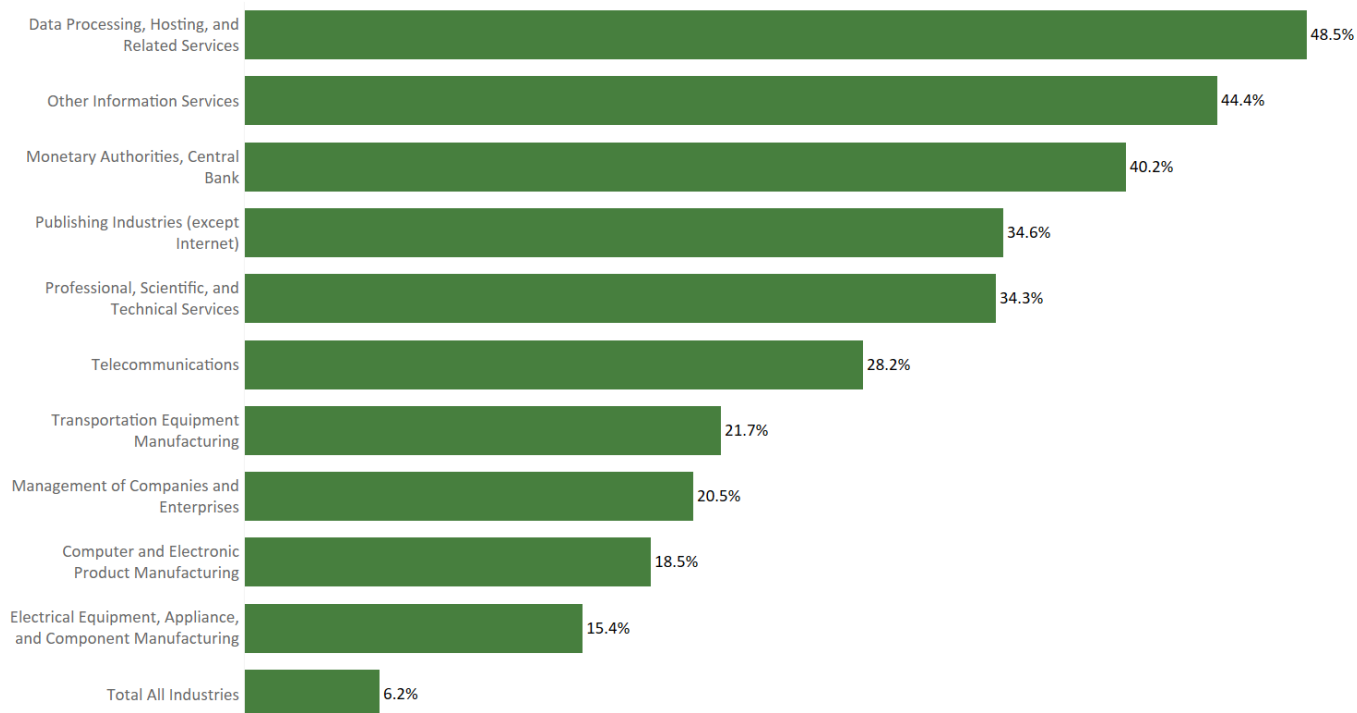
STEM Occupations in Missouri

There are over 100 STEM occupations, and they can be found in many different industries. Some occupations are industry-specific due to their scope, while other occupations are wide-ranging in their industrial usefulness.

Seven of the top 10 STEM occupations by employment are related to computers and computer technology. *Software Developers and Software Quality Assurance Analysts and Testers* have the largest employment (37,088), which is more than twice the employment for *Computer User Support Specialists*, the occupation with the second highest employment. In 2020, STEM occupations made up 5.9 percent of Missouri's total employment. STEM occupations are projected to make up 6.2 percent of total Missouri employment in 2030. In some industries, however, STEM occupations make up a large percentage of those employed, as those industries are more reliant on the skills and knowledge associated with STEM employment. The *Data Processing, Hosting, and Related Services* industry tops the industries with the highest percentage of STEM employment.



STEM Percent of Industry Employment 2030



STEM Location Quotient

Location Quotients (LQs) describe the concentration of an occupation or industry in a geographic region in relation to the nation, with 1.0 being the national average. LQs higher than 1.0 indicate a higher concentration in Missouri relative to the United States, while LQs below 1.0 indicate lower concentrations. The most concentrated STEM occupation in Missouri is *Animal Scientists*, with an LQ of 1.95. *Computer User Support Specialists* is an occupation that has a high LQ (1.15) and a high number of projected annual job openings, with 1,297 openings projected each year.

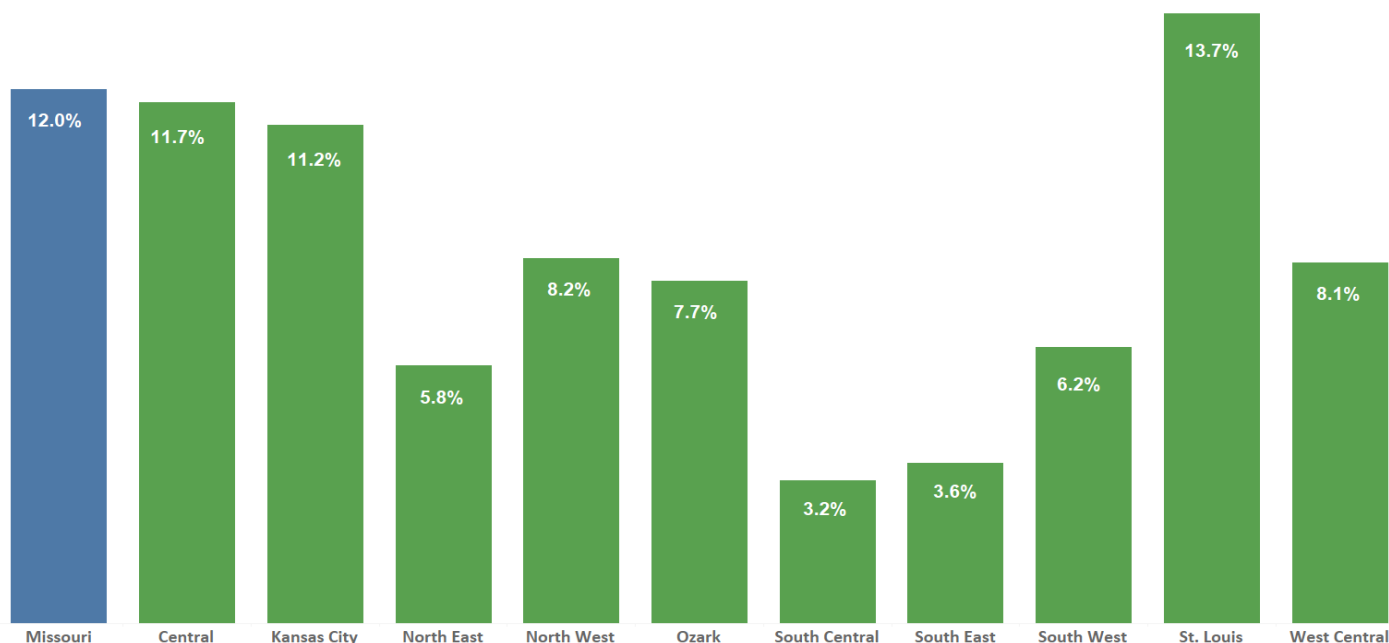
STEM Occupations with Highest Location Quotient

Occupation	2020 Estimated Employment	2030 Projected Employment	2020-2030 Percentage Change	2020-2030 Annual Openings	2020 Average Wages	2022* Location Quotient
Animal Scientists	127	149	17.3%	17	\$92,000	1.95
Forestry and Conservation Science Teachers, Postsecondary	60	64	6.7%	6	N/A	1.89
Social Sciences Teachers, Postsecondary, All Other	669	667	-0.3%	61	\$69,840	1.86
Computer Network Support Specialists	5,199	5,613	8.0%	429	\$60,930	1.43
Agricultural and Food Science Technicians	644	749	16.3%	98	\$48,550	1.40
Database Administrators and Architects	4,168	4,419	6.0%	336	\$83,360	1.31
Materials Engineers	609	692	13.6%	47	\$91,050	1.27
Life, Physical, and Social Science Technicians, All Other	1,594	1,775	11.4%	221	\$48,130	1.18
Computer User Support Specialists	14,557	16,419	12.8%	1,297	\$53,600	1.15
Architectural and Civil Drafters	2,192	2,348	7.1%	230	\$61,020	1.14

STEM Job Postings

From March 1, 2022, to February 28, 2023, there were more than 116,000 online job postings for STEM occupations in Missouri, making up 12 percent of total job postings in the state. The top five employers with the most STEM job ads were Edward Jones, Boeing, Deloitte, Washington University, and General Dynamics. The St. Louis Workforce Development Area (WDA) had the highest number (55,934 STEM postings) and the highest percentage (13.7%) of STEM job postings.

STEM Job Postings as Percent of Total Job Postings



The STEM occupations with the most job postings were *Computer Occupations, All Other* (22,112), and *Software Developers and Software Quality Assurance Analysts and Testers* (20,328). All of the top 10 occupations with the most job postings also have average wages that are higher than the state average of \$50,140 for all occupations. This is consistent with STEM occupations generally having higher wages than non-STEM occupations.

Top STEM Occupations with Most Job Postings

Occupation	2020 Estimated Employment	2030 Projected Employment	2020-2030 Percentage Change	2020-2030 Annual Openings	2020 Average Wages	2022* Job Postings
Computer Occupations, All Other	6,879	7,522	9.4%	584	\$85,570	22,112
Software Developers and Software Quality Assurance Analysts and Testers	30,155	37,088	23.0%	3,122	\$96,530	20,328
Computer User Support Specialists	14,557	16,419	12.8%	1,297	\$53,600	6,529
Computer Systems Analysts	11,097	12,094	9.0%	896	\$85,180	5,393
Engineers, All Other	1,304	1,398	7.2%	94	\$90,230	3,522
Information Security Analysts	2,559	3,399	32.8%	295	\$91,770	3,299
Operations Research Analysts	1,579	2,002	26.8%	159	\$80,190	3,273
Database Administrators and Architects	4,168	4,419	6.0%	336	\$83,360	2,943
Calibration Technologists and Technicians and Engineering Technologists and Technicians, Except Drafters, All Other	870	980	12.6%	96	\$63,030	2,625
Electrical Engineers	3,727	4,004	7.4%	275	\$103,420	2,520

*Job postings data from March 1, 2022 to February 28, 2023 from Lightcast™

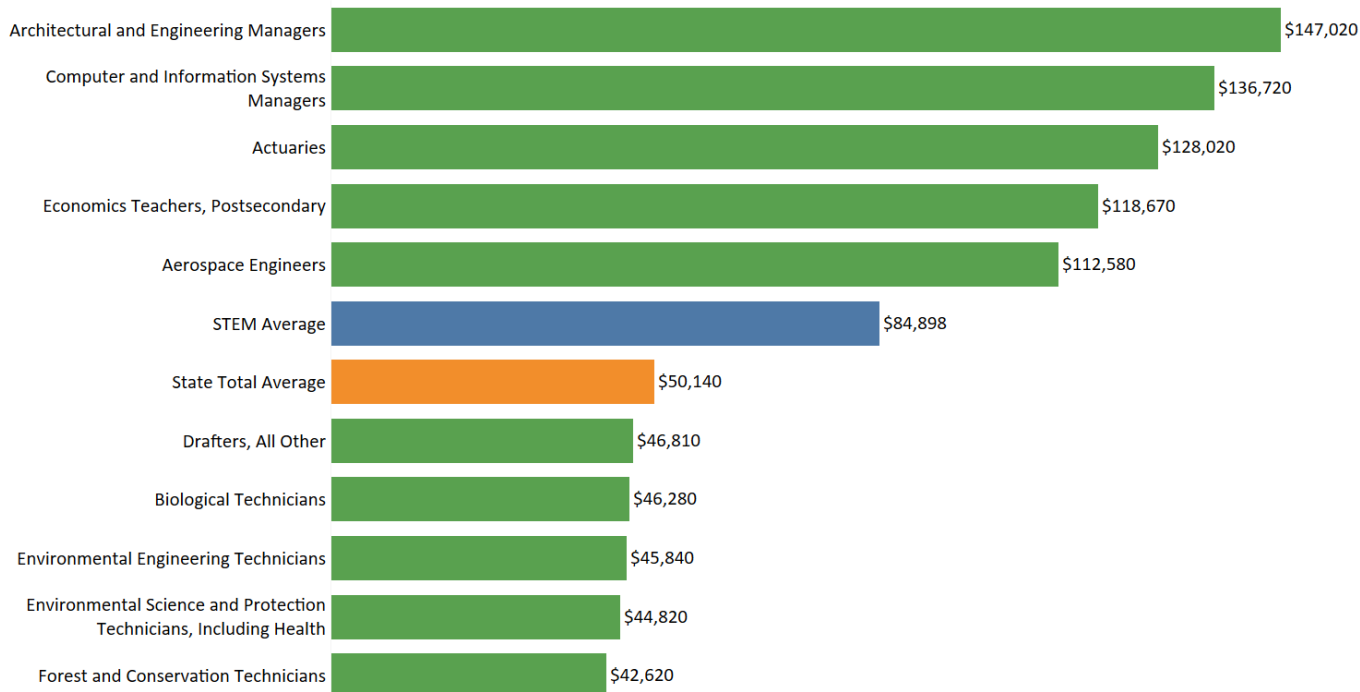
In addition to large numbers of job postings over the last year, eight of the top 10 occupations are projected to have growth rates that are higher than the state average of 7.3 percent for all occupations from 2020-2030. This indicates that not only are these STEM jobs in demand now, but they are also projected to be in demand for years to come.

STEM Earnings and Growth

STEM occupations can be found in many different industries throughout Missouri and are also some of the highest paying jobs in the state. As a group, STEM occupations earn about 70 percent more than the Missouri average. In 2020, STEM occupations accounted for 5.9 percent of Missouri's total workforce, but these same occupations are projected to comprise 10.1 percent of the statewide employment growth from 2020-2030. Missouri's projected growth rate for all STEM occupations is 12.5 percent during that same time frame. Comparing this to the overall projected growth rate for the state of 7.3 percent indicates that STEM occupations are an important part of the state's economic growth.

Similar to other occupations, STEM occupations requiring a higher level of education usually pay more than those that do not. The 10 highest paid STEM occupations require a bachelor's degree or higher. One of the top 10 requires a doctoral or professional degree.

STEM Occupations with Lowest and Highest Wages



Of the more than 110 STEM occupations in Missouri, only eight have an average wage below the state average. With higher-than-average wages, broad industrial appeal, and fast growth rates, STEM occupations are a strong part of Missouri's economy. STEM occupations provide quality jobs now and are projected to be valuable to Missouri's employment future.

STEM Occupations with Most Projected Annual Openings 2020-2030

Occupation	2020 Estimated Employment	2030 Projected Employment	2020-2030 Net Change	2020-2030 Percent Change	2020-2030 Annual Openings	2020 Average Wages
Software Developers and Software Quality Assurance Analysts and Testers	30,155	37,088	6933	23%	3,122	\$96,530
Computer User Support Specialists	14,557	16,419	1862	13%	1,297	\$53,600
Computer Systems Analysts	11,097	12,094	997	9%	896	\$85,180
Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products	6,072	6,727	655	11%	687	\$90,890
Computer Occupations, All Other	6,879	7,522	643	9%	584	\$85,570
Network and Computer Systems Administrators	7,311	7,723	412	6%	522	\$83,910
Industrial Engineers	5,893	6,967	1074	18%	504	\$89,970
Civil Engineers	5,348	6,097	749	14%	474	\$86,410
Computer Network Support Specialists	5,199	5,613	414	8%	429	\$60,930
Web Developers and Digital Interface Designers	4,034	4,578	544	14%	365	\$72,330

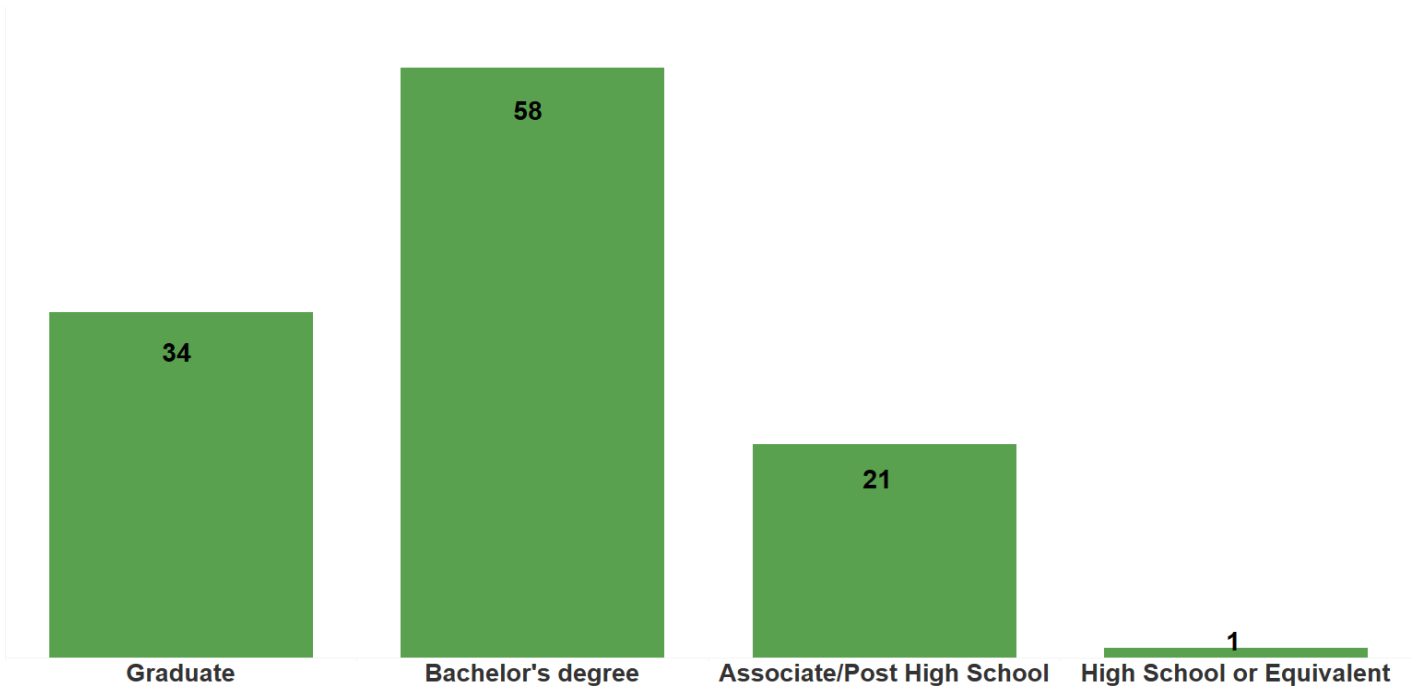
As computers, software, automation, and other forms of technology become increasingly important in our everyday personal and work lives, the demand for workers who can create and maintain these new advances will continue to be on the rise. Seven of the top 10 STEM occupations with the greatest number of projected openings are related to computers.

As innovations create new demands in the workplace, employees and job seekers with education and training in the areas of Science, Technology, Engineering, and Math will be in high demand. These skills are valuable within their own fields of expertise, and areas such as *Transportation Equipment Manufacturing* also have an increasing need for STEM employment. With a solid foundation of employment, wages, and growth, STEM occupations have established themselves as an important part of Missouri's economic future.

STEM Occupations by Education

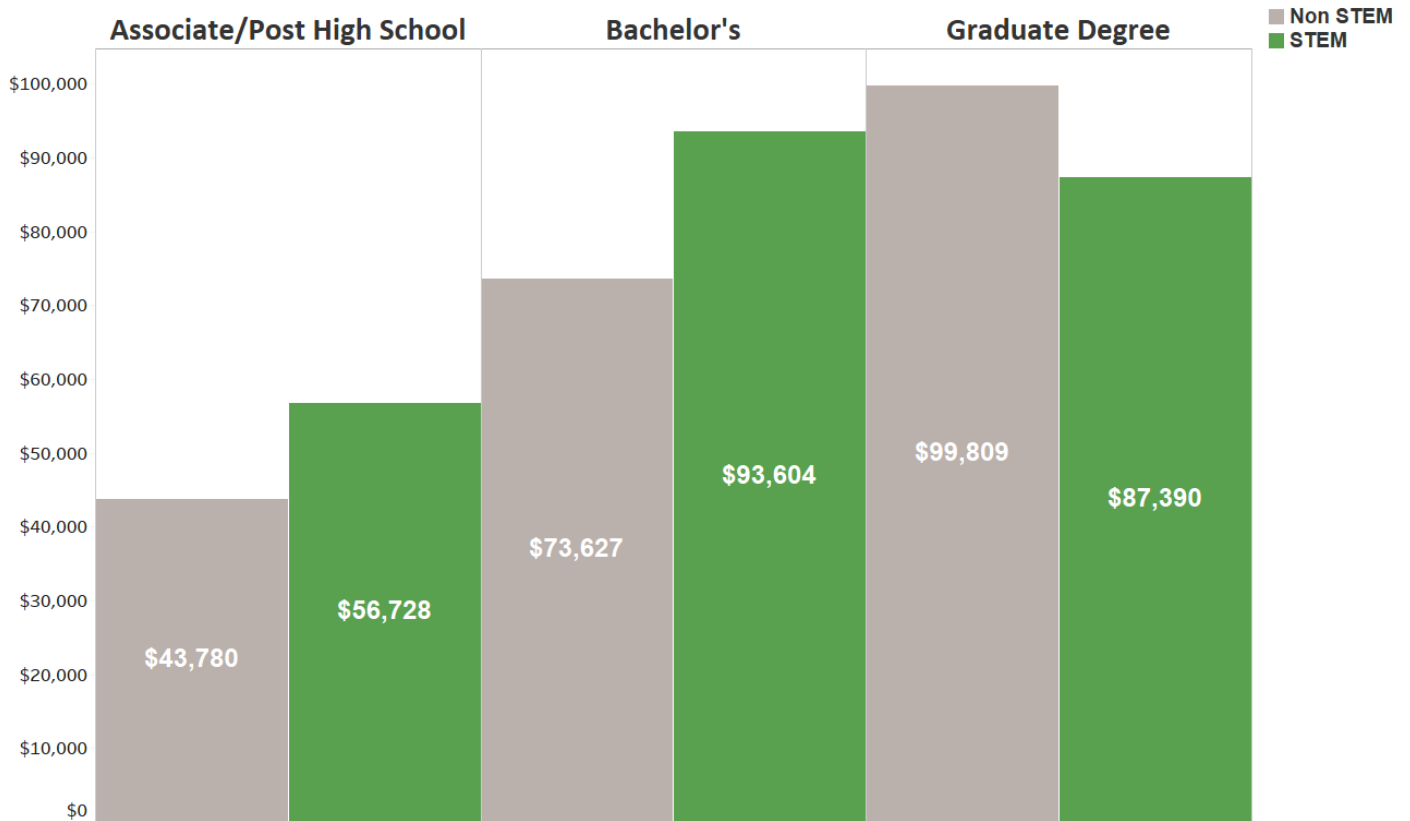
The key to meeting the increased demand for STEM-skilled employees is education. There are 114 occupations classified as STEM in the state of Missouri, and all but one require education beyond the high school level, and 80 percent of all projected STEM job openings require a bachelor's degree or higher.

STEM Occupations by Education Requirement



Workers employed in STEM occupations that typically require an associate degree or postsecondary certificate earn more than their non-STEM counterparts. On average, occupations that typically require an education beyond high school but short of a bachelor's degree earn \$56,728 a year in STEM occupations. Conversely, non-STEM occupations with the same education requirement earn an average of \$43,780 a year. This means that in a typical year, people who focus their education and work experience in areas related to STEM occupations earn about 30 percent more than their non-STEM coworkers.

2020 Annual Wages by Education

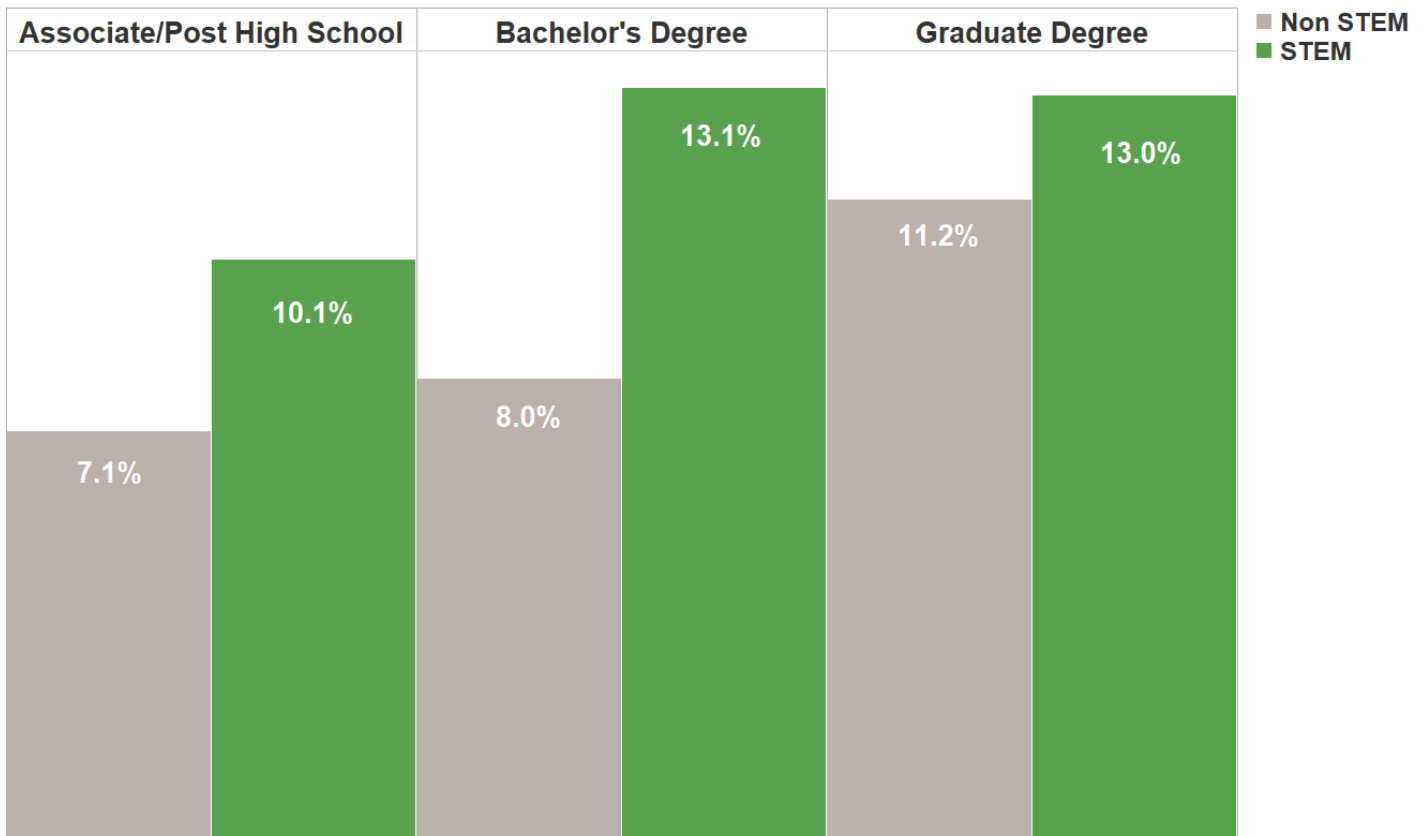


The advantages of a STEM education in Missouri continue at the bachelor's degree level. STEM occupations that typically require a bachelor's degree earn an average of 27 percent more than their non-STEM counterparts. The growth rate for STEM occupations at this education level also outpaces non-STEM occupations.

However, the wage advantages of STEM occupations do not extend to occupations that require a graduate degree. This could be due to STEM occupations requiring a graduate degree being more heavily concentrated in the major occupation group of *Education, Training, and Library*, while *Legal and Management* occupations represent a higher percentage of non-STEM graduate degree occupations. *Legal and Management* occupations generally earn a higher wage than *Education, Training, and Library* occupations.

STEM occupations that typically require a level of education beyond high school and up to a graduate degree are projected to have higher rates of growth than non-STEM occupations from 2020-2030.

Projected Growth Rate by Education 2020-2030



The advantages of STEM occupations are most obvious at the bachelor's degree level. There are 58 STEM occupations that require a bachelor's degree, including 21 that can be found in the *Life, Physical, and Social Science* occupation group. Another 20 occupations are in the *Architecture and Engineering* occupation group.

STEM Bachelor's Degree Occupations

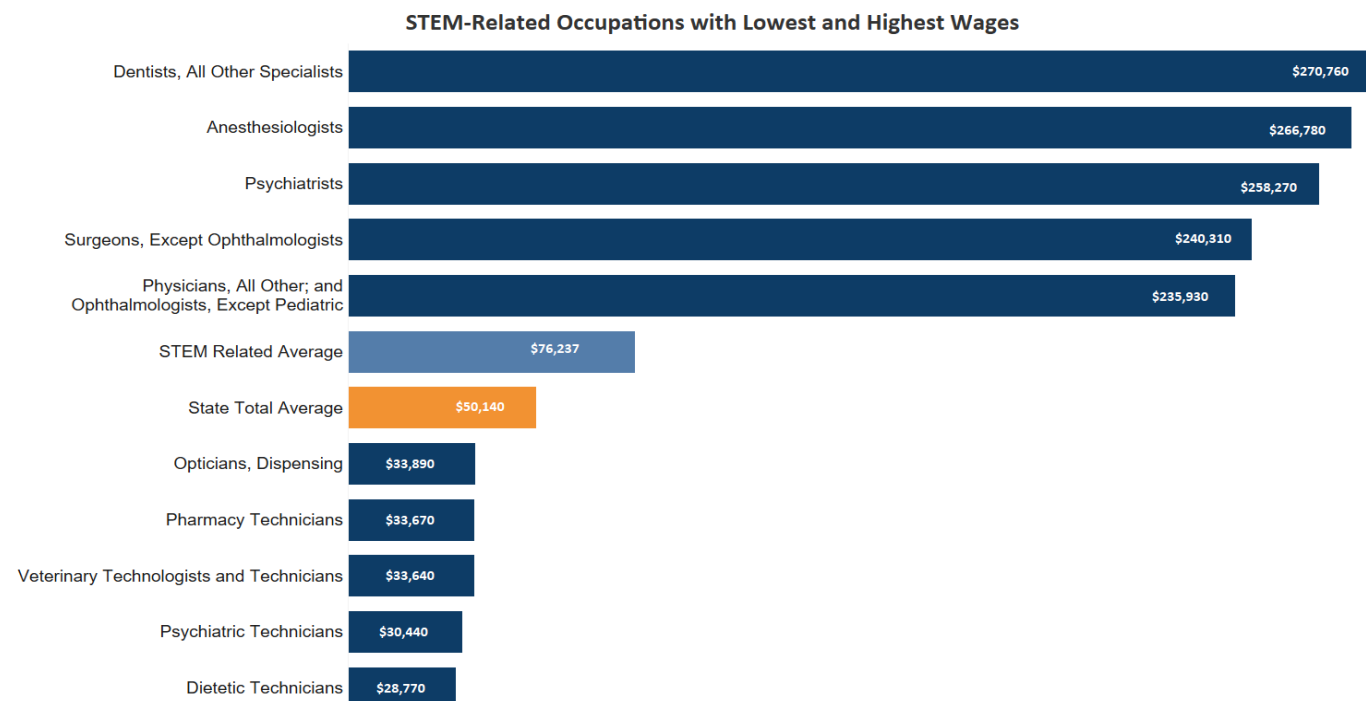
Life, Physical, and Social Science Occupations	21
Architecture and Engineering Occupations	20
Computer and Mathematical Occupations	12
Management Occupations	3
Sales and Related Occupations	2

STEM-Related Occupations in Missouri

STEM-Related occupations rely heavily on many STEM principles but are focused on design and patient care and are in the fields of *Architecture* and *Health Care*. There are 64 STEM-Related occupations in Missouri. The top 10 largest employed STEM-Related occupations are all in the *Health Care* and *Therapy* fields, as are the top 10 STEM-Related occupations with the most projected total openings.

STEM-Related Occupations with most Projected Annual Openings 2020-2030						
Occupation	2020 Estimated Employment	2030 Projected Employment	2020-2030 Net Change	2020-2030 Percent Change	2020-2030 Annual Openings	2020 Average Wages
Registered Nurses	73,333	78,130	4,797	6.5%	4,405	\$65,900
Licensed Practical and Licensed Vocational Nurses	14,829	15,337	508	3.4%	1,190	\$44,490
Medical and Health Services Managers	8,146	10,426	2,280	28.0%	932	\$112,500
Pharmacy Technicians	10,196	10,608	412	4.0%	772	\$33,670
Nurse Practitioners	6,377	9,408	3,031	47.5%	715	\$106,870
Clinical Laboratory Technologists and Technicians	9,053	9,757	704	7.8%	662	\$49,890
Emergency Medical Technicians and Paramedics	7,997	8,419	422	5.3%	574	\$38,170
Medical Dosimetrists, Medical Records Specialists, and Health Technologists and Technicians, All Other	7,164	7,665	501	7.0%	571	\$47,160
Pharmacists	7,188	7,080	-108	-1.5%	257	\$127,430
Family Medicine Physicians	8,113	8,400	287	3.5%	255	\$194,120

The average 2020 wage for all STEM-Related occupations is \$76,237. While lower than the average wage for all STEM occupations, it is still considerably higher than the state average of \$50,140 for all occupations. In fact, 73 percent of all STEM-Related occupations earn more than the state average.



STEM-Related Location Quotients

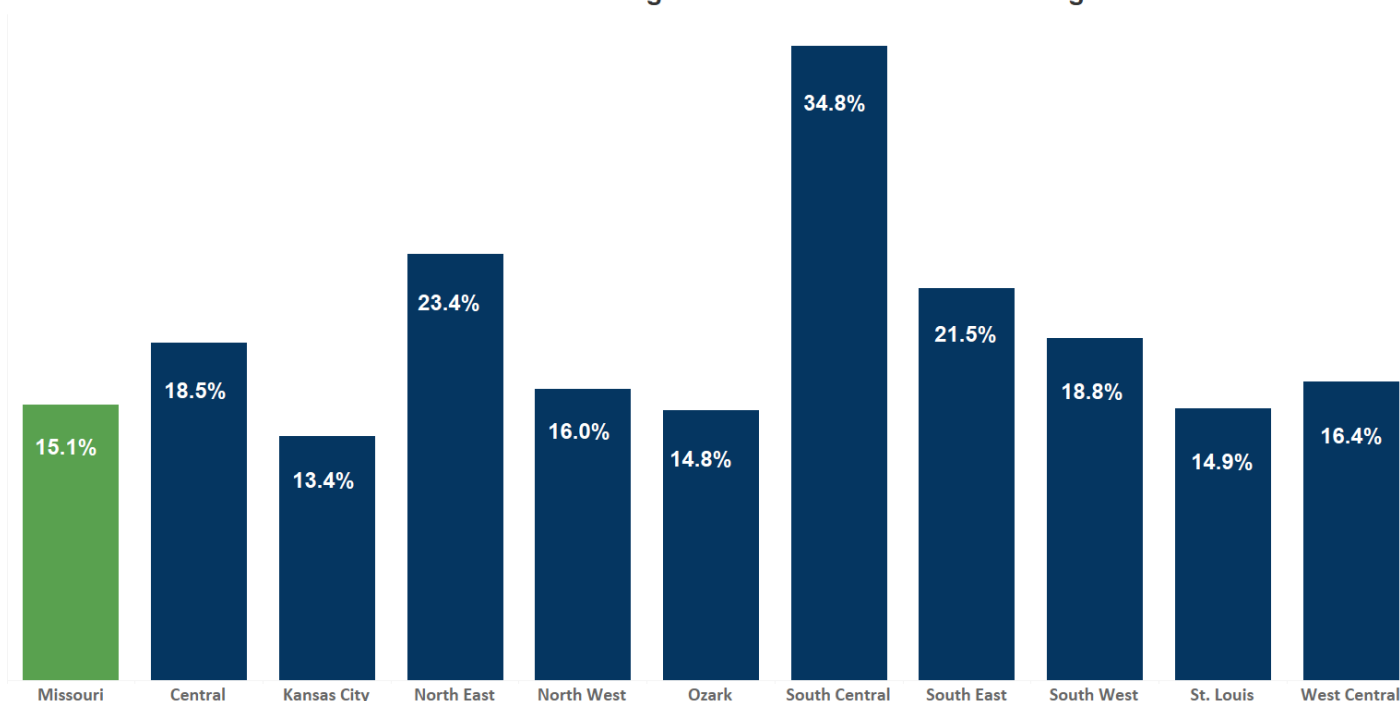
The most concentrated STEM-Related occupation in the state is *Family Medicine Physicians*, with a Location Quotient (LQ) of 3.94. This occupation also has the highest annual wage among the top 10 occupations with the highest LQ. All of the top 10 LQ occupations are from *Healthcare Practitioners and Technical Occupations* occupation category. *Hearing Aid Specialists* is the only top 10 LQ occupation requiring an education of high school or equivalent. The *Nurse Practitioners* occupation has the highest growth rate (47.5%) and highest projected annual openings (715).

STEM-Related Occupations with Highest Location Quotient						
Occupation	2020 Estimated Employment	2030 Projected Employment	2020-2030 Percentage Change	2020-2030 Annual Openings	2020-2030 Average Wages	2020 Location Quotient
Family Medicine Physicians	8,113	8,400	3.5%	255	\$194,120	3.94
Hearing Aid Specialists	264	313	18.6%	25	\$46,340	1.67
Emergency Medical Technicians and Paramedics	7,997	8,419	5.3%	574	\$38,170	1.61
Nurse Practitioners	6,377	9,408	47.5%	715	\$106,870	1.52
Nuclear Medicine Technologists	503	534	6.2%	39	\$76,850	1.44
Radiation Therapists	485	519	7.0%	29	\$78,160	1.41
Clinical Laboratory Technologists and Technicians	9,053	9,757	7.8%	662	\$49,890	1.41
Magnetic Resonance Imaging Technologists	1,085	1,120	3.2%	81	\$65,090	1.35
Health Information Technologists, Medical Registrars, Surgical Assistants, & Healthcare Practitioners, AO	2,088	2,252	7.9%	168	\$52,860	1.35
Audiologists	340	389	14.4%	20	\$72,660	1.27

STEM-Related Job Postings

From March 1, 2022, to February 28, 2023, there were over 146,500 online job postings for STEM-Related occupations in Missouri, making up 15.1 percent of the total job postings in the state. The top five employers with the most STEM-Related job ads were SSM Health, Mercy Health, BJC Healthcare, Hospital Corporation of America, and Saint Luke's Health System. While the St. Louis WDA had the largest number of STEM-Related job postings, the South Central WDA had the highest percentage of STEM-Related job postings.

STEM-Related Job Postings as Percent of Total Job Postings



Nine of the top 10 STEM-Related occupations with the most job postings are from the *Healthcare Practitioners and Technical Occupations* major group. *Registered Nurses* have the most job postings (58,381) and projected annual openings (4,405), which is almost four times the annual openings from the second top occupation, *Licensed Practical and Licensed Vocational Nurses* (1,190).

Top STEM-Related Occupations with Most Job Postings

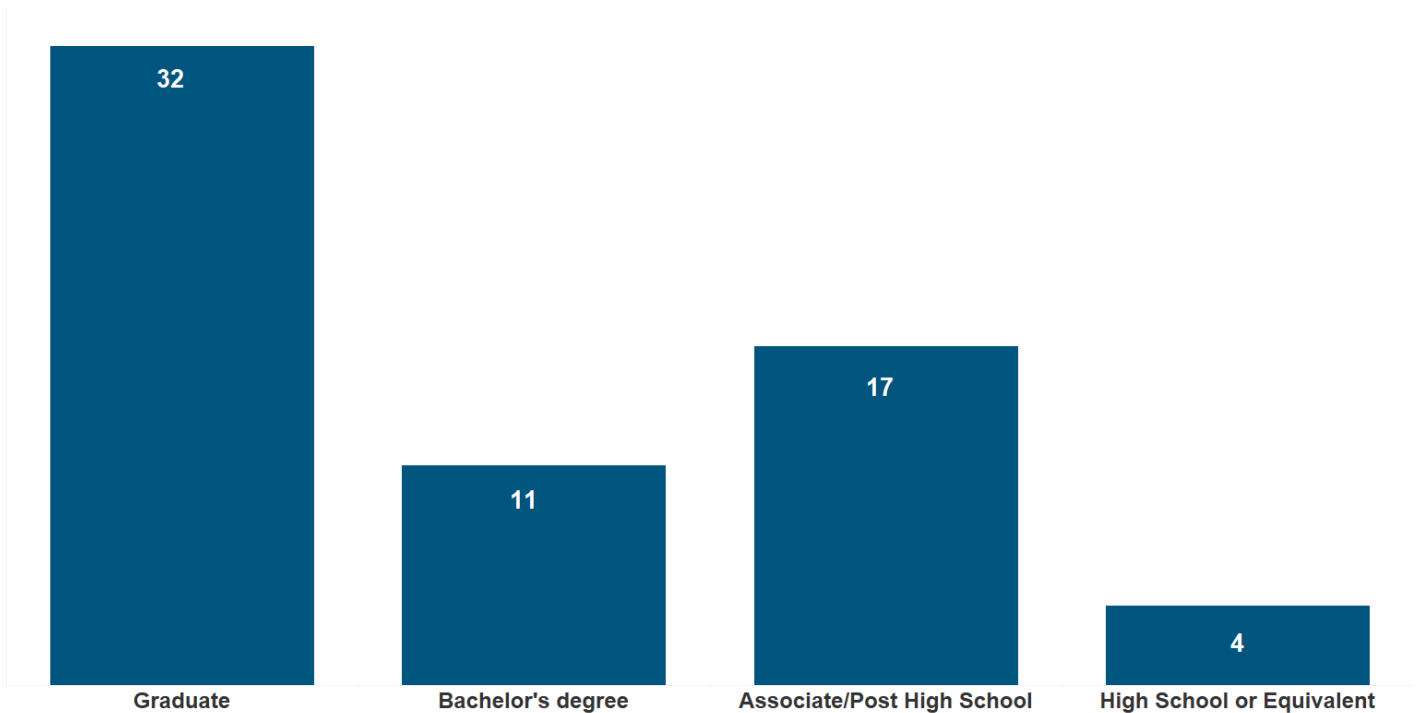
Occupation	2020 Estimated Employment	2030 Projected Employment	2020-2030 Percentage Change	2020-2030 Annual Openings	2020 Average Wages	2022* Job Postings
Registered Nurses	73,333	78,130	6.5%	4,405	\$65,900	58,381
Licensed Practical and Licensed Vocational Nurses	14,829	15,337	3.4%	1,190	\$44,490	11,926
Medical and Health Services Managers	8,146	10,426	28.0%	932	\$112,500	11,873
Medical Dosimetrists, Medical Records Specialists, and Health Technologists and Technicians, All Other	7,164	7,665	7.0%	571	\$47,160	8,660
Clinical Laboratory Technologists and Technicians	9,053	9,757	7.8%	662	\$49,890	5,201
Physicians, All Other; and Ophthalmologists, Except Pediatric	3,497	3,609	3.2%	108	\$235,930	5,193
Nurse Practitioners	6,377	9,408	47.5%	715	\$106,870	3,298
Physical Therapists	4,663	5,438	16.6%	283	\$84,660	3,212
Pharmacy Technicians	10,196	10,608	4.0%	772	\$33,670	2,822
Surgical Technologists	1,920	2,070	7.8%	155	\$44,990	1,981

*Job postings data from March 1, 2022 to February 28, 2023 from LightcastTM

STEM-Related Occupations by Education

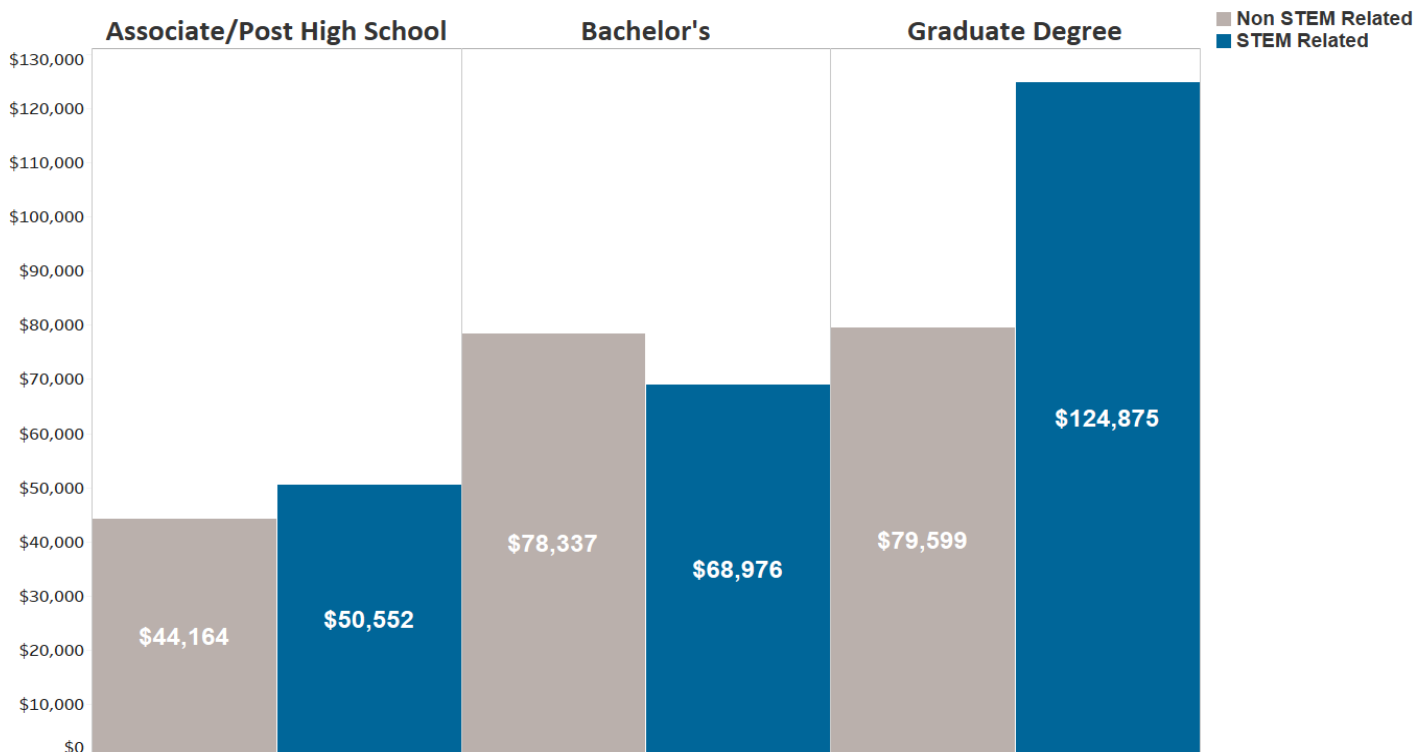
The vast majority of STEM-Related occupations require some form of education or training beyond a high school diploma. In fact, 60 of the 64 STEM-Related occupations require an education beyond the high school level, and 43 occupations require a bachelor's degree or more.

STEM-Related Occupations by Education Requirement

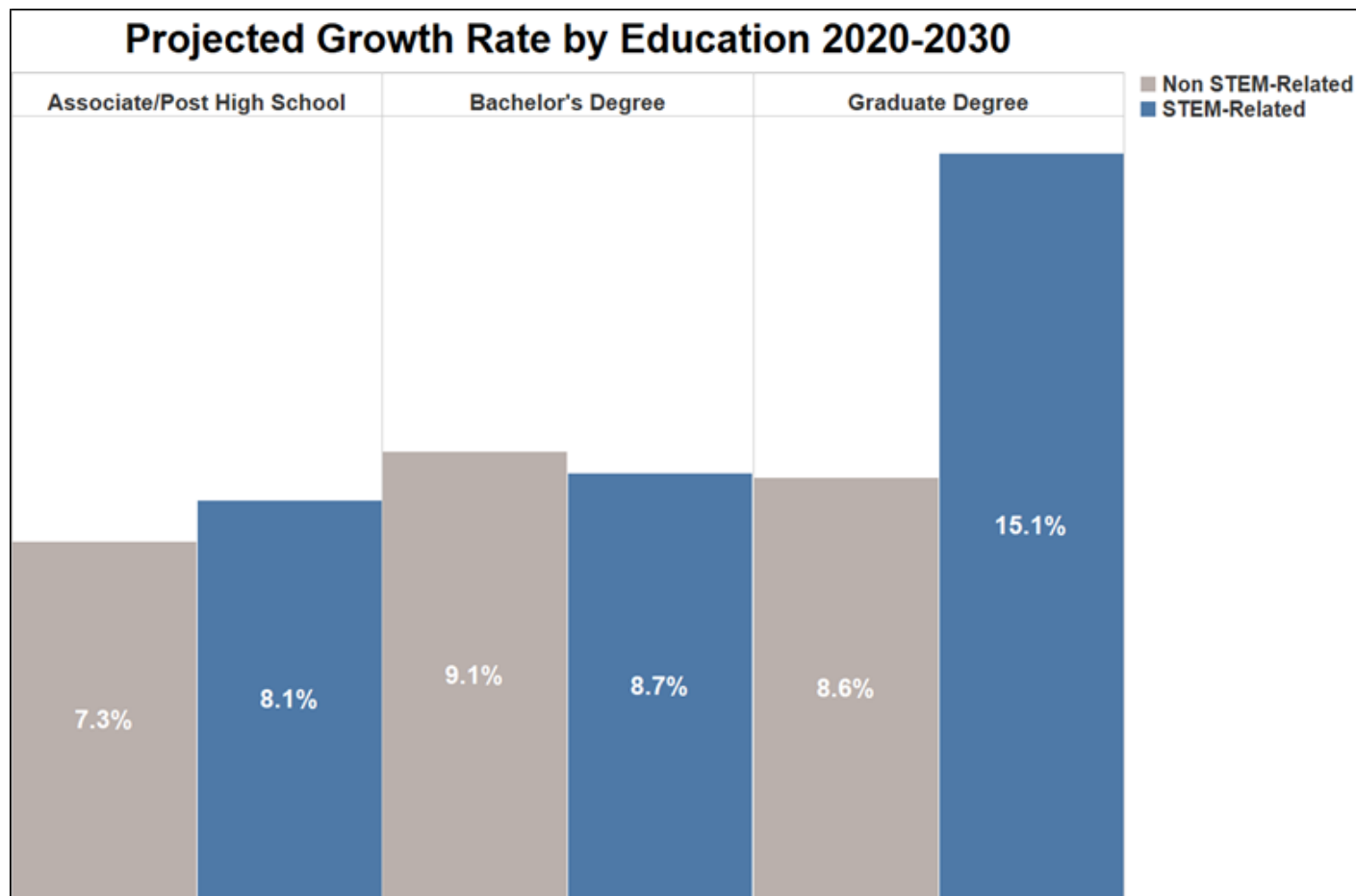


At the highest degree levels, master's and doctoral degrees, the wage advantages of a STEM-Related occupations are the most obvious. STEM-Related occupation that typically require a graduate degree earn an average of \$124,875 annually, compared to an average of \$79,599 for non-STEM-Related occupations requiring a graduate degree.

2020 Annual Wages by Education



STEM-Related occupations are expected to be an important part of the workforce of the future. The 2020-2030 projected average growth rate for all STEM-Related occupations is 9.9 percent, which is 2.6 percentage points more than the overall projected growth rate for all occupations. STEM-Related occupations at the graduate and associate/post-high school education levels are projected to grow faster than the state average for non-STEM-Related occupations.



Notes

The Missouri Economic Research and Information Center (MERIC) uses the definitions developed by the Standard Occupational Classification Policy Committee (SOCPC)¹ to classify occupations as STEM or STEM-Related. The acronym “STEM” is widely used in discussions across government, academia, and business, given increased emphasis on innovation and its implications for the economy and labor market. The discussion and analyses quickly get confounded since there is no commonly agreed-upon definition of STEM. In July 2011, OMB asked the SOC Policy Committee (SOCPC) to recommend options for defining STEM occupations based on the 2010 SOC in order to enhance the comparability of data across statistical agencies and organizations studying the STEM workforce for policymaking purposes, including educational and workforce planners. Information regarding the process for developing the 2010 SOC STEM list is available at <https://www.bls.gov/soc/2010/#crosswalks>.

With the publication of the 2018 SOC, the SOCPC initiated an update to their recommendation on STEM occupations. To maximize the comparability of data, the SOCPC agreed to maintain the same framework as used in the 2010 STEM occupations recommendation. The framework gives users options for defining STEM occupations while also allowing for comparison across agencies and organizations. The SOCPC approved the updated recommendation in December 2018 and then finalized its recommendation to OMB in June 2019.

This report covers those occupations determined by the committee to be STEM occupations.² The SCOPC divided STEM occupations into two domains and four sub-domains. Occupations in the sub-domains of *Life and Physical Science, Engineering, Mathematics, Information Technology*, and *Social Science* are designated as “STEM Core” or just “STEM.” Occupations in the sub-domains of *Architecture* and *Health* are designated as “STEM-Related.”

With the full implementation of the 2018 SOC structure, starting with the 2021 OEWS estimates and 2022-2032 employment projections, the SOC codes that are classified as STEM will change.³ These are almost all due to SOC code changes from the 2010 to 2018 SOC system and not due to the SOCPC redefining which occupations it considers to be STEM. The exceptions are the occupations of *Occupational Health and Safety Specialists* and *Occupational Health and Safety Technicians*, both of which were considered to be STEM occupations according to the 2010 SOC STEM list but not the 2018 SOC STEM List.⁴

Sources:

U.S. Bureau of Labor Statistics (BLS) Occupational Projections used to define typical education and training requirements. Accessed March, 2023.

U.S. BLS Division of Occupational Employment and Wage Statistics (OEWS) data used to define STEM occupations and wages. Accessed March, 2023.

Occupational and Industry Employment Projections developed by the Missouri Economic Research and Information Center (MERIC).

Lightcast™ used for job postings data. Accessed March, 2023.

The workforce solution was funded by a grant awarded by the U.S. Department of Labor’s Employment and Training Administration. The solution was created by the grantee and does not necessarily reflect the official position of the U.S. Department of Labor. The Department of Labor makes no guarantees, warranties, or assurances of any kind, express or implied, with respect to such information or its completeness, timeliness, usefulness, adequacy continued availability or ownership. This product is copyrighted by the institution that create it. Internal use by an organization and/or personal use by an individual for non-commercial purposes is permissible. All other uses require the prior authorization of the copyright owner.

Endnotes:

1 Attachment A: Options for defining STEM (Science, Technology, Engineering, Mathematics) occupations under the 2018 Standard Occupation Classification (SOC) system. Retrieved April, 2023 from https://www.bls.gov/soc/Attachment_A_STEM_2018.pdf

2 Attachment C: Detailed 2010 SOC occupations included in STEM SOC Policy Committee recommendation to OMB. Retrieved April, 2023 from https://www.bls.gov/soc/attachment_c_stem.pdf

3 Attachment A: SOC Policy Committee recommendations regarding STEM definition. Retrieved April, 2023 from https://www.bls.gov/soc/Attachment_A_STEM.pdf

4. Attachment C: Detailed 2018 SOC occupations included in STEM SOC Policy Committee recommendation to OMB. Retrieved April, 2023 from https://www.bls.gov/soc/Attachment_C_STEM_2018.pdf